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ON ANCIENT CRYPTS

CRYPT IN LASTINGHAM CHURCH, YORKSHIRE.

In details relating to architecture, we meet with frequent mention of a portion of an ecclesiastical edifice called the *Crypt*. This name appears to have varied somewhat in its application; for several of the places which we now call crypts, differ in some respects from those which in former times bore that name. Generally speaking, however, we may say that a crypt (the Greek word signifies a place of *concealment*) is a subterraneous vault, or chapel, constructed beneath the high altar, or eastern end of many cathedral, abbey, and collegiate churches, for preserving the bodies of martyrs and holy persons, and for the performance of Divine Worship.

Catacombs, or subterraneous places, used among the ancients for the burial of their dead, were resorted to by the primitive Christians as places of security from their persecutors, and this, doubtless, from the knowledge that such receptacles were deemed sacred and inviolable, and might therefore be expected to afford them a sure retreat. Some authors have maintained the strange idea that the Christians themselves were the excavators of the catacombs; but the vast extent of these subterranean galleries, as they exist at Rome, Naples, Syracuse, &c., and the inability of the persecuted flock to carry on such undertakings, have only to be considered, to make this opinion appear very extravagant and absurd.

Doubtless, the Christians took these catacombs, as they naturally presented themselves as places of retreat: they became their places of abode, their churches, and their burial-places; and around the tombs of the earlier saints and martyrs, there deposited, they met together, to encourage each other in their holy faith, and to perform the rites of their religion. When the persecution ceased, and they were no longer obliged to hide themselves from the malice of enemies, but were at liberty to raise public edifices for the performance of Divine Worship, they naturally chose out such situations for this purpose as should mark the remains of their martyred relatives or friends which lay beneath; and gradually as these remains came to be considered as endowed with peculiar sanctity, it became the rule never to consecrate an altar till the remains of some saint were placed within its bosom, or under its base. When churches were required at places distant from the catacombs, similar excavations, but smaller in extent, were made beneath the altars, and relics transferred to them. The excavation just alluded to was the crypt, or vault, which was partly raised above the level of the floor, and partly sunk beneath it. The descent to the crypt was by a number of steps in the nave, or transept, and other steps ascended from it to that part of the sanctuary immediately over the crypt. The contents of the crypt were seen from above, through grated apertures; and over the tomb of the saint was placed the altar. These crypts were likewise furnished with all the requisites for wor-

ship; and in the writings of William Thorn, the monk of Canterbury, mention is made of a particular collect to be said in the service performed in crypts. Thus the crypt, as well as being the depository of the bodies or limbs of departed saints (for where the whole body could not be obtained, a limb was regarded by the devotees with almost equal reverence), was also a sort of subterraneous church or chapel, and, according to the reputation for sanctity borne by the person whose remains it enclosed, was thronged with worshippers, and honoured with exterior embellishments in the grandeur of the edifice raised above it. The church of San Martino, at Rome, was raised in the year 500, by Pope Symmachus, over a subterraneous chapel, or crypt, which contained the body of Pope Sylvester; and St. Peter's, at Rome, was built above the crypt of the martyrs that suffered in the circus of Nero.

Crypts are also found unconnected with any religious edifice; but forming in themselves both temple and tomb. About a quarter of a mile northward of Laodicea, in Syria, are several such crypts, or sepulchral chambers, hollowed in the rocky ground, and varying from ten to thirty feet square. In most of these crypts there is a range of narrow cells, each large enough to receive one coffin in width, and two or three in length. In one crypt, named after St. Teckla, is a fountain, to which the Greek Christians used to bring diseased persons, for the anticipated recovery of their health, by ablution in the fountain. Jerusalem and its neighbourhood contains many crypts, in which are stone benches, instead of cells, for the reception of coffins. How far sepulchres of this kind were in use in Syria, before the Christian era, is uncertain; but the sepulchre in which our Saviour was laid is described by the Evangelists as being hewn out of a solid rock; and, from the circumstance that Mary and John had to stoop down, in order to look into the sepulchre, we may infer that the sepulchre was below the level of the ground. There are many sepulchres in and around the Mount of Olives, which appear to have been used as burial-places for holy persons.

This custom of placing the last earthly remains of inspired or holy men apart from those of other persons, was adopted by the Church of Rome; but with many of those debasing and irreligious infringements which that church made in the middle ages, and by which the Romish Calendar became crowded with saints of human creation. When the Gothic cathedrals of Europe were built, the construction of a crypt, probably for some such purpose as we have indicated, was very common; and among them are the crypts beneath Canterbury, York, and Winchester Cathedrals, and those beneath the churches of Grimbald, Christ Church, Wimburn, Dorchester, Grantham, Peterborough, Waverley, Wells, &c.

In Protestant countries the crypts are seldom now used, either for sepulchres or for chapels; indeed so long have most of them been disused, that many writers are in doubt whether they were originally designed for sepulchres or for chapels. In Buildwas Abbey Church, Shropshire, there is a crypt, beneath the north transept, extending the whole length of the transept from east to west, and about half its width from north to south. The principal entrance to this crypt was at the west end, by a flight of steps out of the cloister; and there seems to have been also a doorway in the northern wall of the crypt. This subterranean vault, whatever may have been its original destination, has long been used as a cellar.

Canterbury Cathedral contains a vast vault, or rather series of vaults, which is called the crypt, or undercroft, and which is supported by numerous piers and massive columns. This crypt, if such be its real nature, appears to be much larger than the generality of such vaults.

Other crypts, as we have said, are to be found beneath many cathedrals and ancient churches; but it will be sufficient for us here briefly to notice that which is represented in the wood-cut at the head of this article, and which is the crypt beneath the ancient church of Lastingham, in the north riding of Yorkshire.

Lastingham Church is situated about five miles from Kirby Moorside, in the mountainous part of the north riding, and is so ancient that great diversity of opinion exists as to many points connected with its history. According to Bede, a small monastery was founded on this spot by Bishop Cedd, during the time of the Heptarchy, both as a place of worship and as a sepulchre. When the bishop died, he was buried on the outside of the monastery; but in process of time a stone church was built in the monastery, and the body of the prelate was buried at the right-hand side of the altar.

During the two centuries which immediately preceded the Norman conquest of England, very little is known of Lastingham Monastery; but it is supposed to have been ruined and destroyed during the Danish wars of those times. We find that in 1078 Lastingham was included in the royal demesne, and that Stephen, abbot of Whitby, solicited permission to establish a new monastery at Lastingham, on account of the exposure of Whitby Abbey to pirates and robbers. From that time scarcely anything is known of Lastingham Monastery or Church. The latter became a parochial church at some subsequent period, but at what time is not now known.

The crypt underneath this church has by many persons been supposed to be of Saxon construction, the remnant of the monastic church built before the Conquest; but Mr. Britton considers it to be a specimen of the early Norman style, and to have formed part of the monastery built by the abbot of Whitby, after his removal to Lastingham, since it corresponds with other known crypts of the Norman age, in the massive character, forms and ornaments of the columns, and the simplicity of the groining and arches. The crypt is about forty-one feet in length, from east to west, and twenty-two in width, from north to south. The present entrance descends by a trap-door and flight of steps from the west end of the nave of the church; but there was formerly another entrance from a vaulted passage on the north side, which was traditionally reported to have extended to a distance of two or three miles from the church, underground. On entering the crypt, however, by the present entrance, at the west end, we come to a square vault, measuring about twenty-one feet each way, the roof being supported by four massive columns, nearly equidistant. On the eastern side of this square portion, and close to the north and south walls, are two loop-holes, which serve for windows. Between these loop-holes is an opening leading to another portion of the vault, nearly semi-circular, and measuring about eighteen feet by thirteen. At the eastern extremity of this portion, and of the whole vault, is another loop-hole, serving to admit a dim light to the crypt.

The sight of this and similar structures may well serve to recal to our minds the period and the sufferings which first made it necessary for those who bore the name of Christ to seek for subterraneous places of worship; nor can we do this without remembering our own superior privileges, and the reason we have gratefully to follow the faith of those who witnessed a good confession in the midst of so many difficulties, and at a time when, to use the language of our homilies, "They had but low poore conventicles, and simple oratories, yea, caves under the ground, called *cryptæ*, where they for feare of persecution assembled secretly together."

CHRISTIANITY recommends itself to us at first sight by this peculiar presumption of its being the true religion, that it makes application to men as reasonable creatures, and claims our assent on account of the proofs which it offers.—ARCHBISHOP SECKER.

CALCULATING MACHINES.

I. Napier's Bones.—The Ancient Abacus.

A large portion of those labours to which the human mind is directed, have for their object the more speedy attainment of something which can already be attained by slow means: what we term a new invention, a new process, or a new art, is not always a means of doing something which could *not* be effected before, or without it, but is oftentimes only an improvement by which a given object can be attained better and more speedily. The same, to a certain extent, may be said of the processes of arithmetic: multiplication is not a totally different process from addition,—it is not, therefore, a means of effecting that which could not be effected without it, but it is a *speedier* means of effecting that which is within the scope of addition. When we multiply 12 by 8, we in effect add up 12 eight times; but, by the aid of the multiplication table, we lose sight of the process of addition, and at once conclude that 12 multiplied by 8 equals 96. So, likewise, division is but a speedier kind of subtraction; for, if we have to divide 24 by 6, we in effect subtract 6 four times over, by which we separate 24 into four parcels of 6 each.

To one who has the multiplication table committed to memory, the performance of this process is as easy as that of addition; but, where this is not the case, the process of multiplication becomes rather tedious, as our forefathers 200 years ago very generally felt it to be: they were not then taught from infancy the multiplication table, up to 12 times 12, any more than we now commonly learn it beyond that step.

It was, therefore, to afford them aid that the celebrated Napier, the inventor of Logarithms, devised the little instrument, or series of instruments, known as "Napier's rods," or "Napier's bones;" the mode of constructing which is as follows:—Provide several slips of card, wood, or metal, about nine times as long as they are broad; and divide each of them into 9 equal squares. Inscribe at the top square of each slip one of the numbers of the natural series, 1, 2, 3, 4, &c., to 9 inclusive. Then divide each of the remaining squares into two parts by a diagonal line drawn from the upper right hand corner to the lower left hand corner; and inscribe in each of these triangular divisions, proceeding downwards, the double, triple, quadruple, &c., of the number inscribed at the top; taking care, when the multiple consists of only one figure, to place it in the lower triangle, and when it consists of two, to place the units' figure in the lower triangle, and the ten's in the upper one. It will be necessary to have one of these slips or rods, the squares of which are not divided by a diagonal, but inscribed with the natural numbers from 1 to 9: this one is called the *index*-rod. It will be proper also to have several slips of each kind, so that there may be one for each particular figure.

The rods being prepared, let us trace the process of multiplying, for instance, the number 6785399. Arrange seven of the rods or slips inscribed at the top with the figures close to each other, and apply to them on the left hand the index-rod. The arrangement will then be as in the annexed figure, a little inspection of which will show that we have a table of all the multiples of each figure in the multiplicand; and scarcely anything more will be necessary than to transcribe them. Thus, for example, to multiply the above number by 6: looking for 6 on the index-rod, and opposite to it in the first square on the right hand, we find 54: write down the 4 found in the lower triangle, and add the 5 in the upper one to the 4 in the lower triangle of the next square on the left, which makes 9: write down the 9, and then add the 5 in the upper triangle of that square to the 8 in the lower triangle of the next one to the left. Proceed in this manner, taking care to carry as in common addition; and we shall find the result to be 40712394, or the product of 6785399 multiplied by 6.

1	6	7	8	5	3	9	9
2	1/2	1/4	1/6	1/0	0/6	1/8	1/8
3	1/8	2/1	2/4	1/5	0/9	2/7	2/7
4	2/4	2/8	3/2	2/0	1/2	3/6	3/6
5	3/0	3/5	4/0	2/5	1/5	4/5	4/5
6	3/6	4/2	4/8	3/0	1/8	5/4	5/4
7	4/2	4/9	5/6	3/5	2/1	6/3	6/3
8	4/8	5/6	6/4	4/0	2/4	7/2	7/2
9	5/4	0/3	7/2	4/5	2/7	8/1	8/1

NAPIER'S RODS OR BONES.

A little reflection will show that the same instrument would be available for a larger multiplier. Suppose that the same multiplicand is to be multiplied by 839938. Write down the multiplicand and the multiplier below it, in the usual manner; and as the first figure of the multiplier is 8, look for it in the index-rod, and by adding the different figures in the triangles of the horizontal column opposite to it, the result will be 54283192, or the product of the above number by 8. Then find the result of the figures in the horizontal column opposite to 3, and write the sum down as before, but carrying it one place farther to the left. Continue in this manner, until all the figures of the multiplier have been used; and if the several partial products be then added as usual, the total product, 5699314465262, will be the same as that resulting from common multiplication.

Thus it will be seen that the process of multiplication, as performed by Napier's rods, is nothing more than a series of additions; so that a person totally ignorant of multiplication may perform processes coming under that rule. The rods may also be made occasionally serviceable in shortening the process of division, especially when large sums are to be often divided by the same division. Thus: if the number 1492992 is to be divided by 432, and if the same division were frequently to occur, construct, in the manner before described, a table of the multiples of 432 by all the units.

1 times 432 =	432
2 " " =	864
3 " " =	1296
4 " " =	1728
5 " " =	2160
6 " " =	2592
7 " " =	3024
8 " " =	3456
9 " " =	3888

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432)1492992(3456
   1296
   ----
   1969
   1728
   ----
   2419
   2160
   ----
   2592
   2592
   ----
   ...
```

Since 432 is not contained in the first three figures of the dividend, some multiple of it must be contained in the first four figures, viz., 1492. To find this multiple, look at the table, where it will be seen that the next less multiple of 432 is 1296, which stands opposite to 3. Write down 3 in the quotient, and 1296 under 1492; then subtract the former from the latter, and there will remain 196, to which if the next figure of the dividend be brought down, the result will be 1969. Again referring to the table, we find that 1728, which stands

opposite to 4, is the greatest multiple of 432 contained in 1969: write down 4 therefore in the quotient, and subtract as before. By continuing the operation in this manner, it will be found that the other figures of the quotient are 5 and 6, and that there is no remainder.—We will here again remind the reader, that he must not test the excellence of such an expedient as this by the present state of knowledge on arithmetical subjects, but by the wants of society at the time when Napier lived, more than two hundred years ago.

A mechanical contrivance for facilitating the processes of arithmetic to uneducated persons, under the name of the ABACUS, has been known in various countries for a long period. The principle of the instrument is, to express numbers by the relative position of beads sliding upon wires, or of counters placed between lines. The Chinese abacus, called *shwan-pan*, consists of several series of beads strung on brass wires, stretched from the top to the bottom of the instrument, and divided in the middle by a cross-piece from side to side. In the upper space every string has two beads, which are each counted for 5, and in the lower space every string has five beads, of different values, the first being counted as 1, the second as 10, the third as 100, &c. This apparatus is commonly used in the shops of China, and the natives are very expert in the working of it. The Grecian abacus was nearly the same as that of the Chinese, except that little ivory balls were used instead of beads. The Roman abacus differed a little from the Grecian, in having pins sliding in grooves, instead of beads or balls sliding on wires. The abacus used at the present day in some European countries is made as follows:—small counters are provided, and a sheet of paper is ruled with parallel lines, each two being at such a distance as may be at least equal to twice the diameter of the counter. Then the value of the lines thus drawn, and of the spaces between them, increases from the lowest to the highest in a tenfold proportion: thus:—counters placed upon the first line signify so many units or ones; on the second line, tens; on the third line, hundreds; on the fourth line, thousands; and so on. In like manner, a counter placed in the first space, between the first and second lines, denotes 5; on the space next above it, 50; on the third space, 500, on the fourth space, 5000; and so on. So that there are never more than four counters placed on any line, nor more than one in any space; this being of the same value as five counters on the next line below. Thus, 47382 is indicated in this manner:—two counters on the lower line implying units 2; three on the second line, and one in the space above it, indicating conjointly 80; 3 on the third line, for 300; 2 on the fourth line, and 1 in the space above it, for 7000; and 4 on the fifth line for 40,000.

Numerous contrivances have been from time to time introduced, bearing resemblance more or less to the abacus, or to Napier's rods. Mr. Gamaliel Smethurst, in the forty-sixth volume of the *Philosophical Transactions*, described a variation of the Chinese shwan-pan, which appeared to him to increase its usefulness; for besides teaching arithmetic to persons ignorant of it, he deemed it useful "to examine accounts by; for, as the person will, by the shwan-pan, work it in quite a different way, it will serve as if another person had gone through the account; if it proves right with the written one, they may rest assured the work is true." Many other individuals have likewise directed their attention to this subject. Sir Samuel Moreland published, in 1673, an account of two arithmetical machines, the construction of which however, he did not explain. Leibnitz, Poleni, Perrault, Lespine, Boistissandeau, and others devised machines, having a similar object in view. As there is a good deal of similarity between many of these contrivances, we will not stay to describe them, but will, in another article, speak of the ingenious means by which Dr. Saunderson, the blind mathematician, established a kind of palpable arithmetic; and also of a calculating machine invented by Pascal.

The reader should know that the words "calculate" and "calculation" are derived from the Latin word *calculus*, a counter, or pebble: hence, among the Romans, accountants were called *calculatores*.

THE BURNT PILLAR AT CONSTANTINOPLE.

VARIOUS writers have described a remarkable column standing in the city of Constantinople, but I have not found two that give the same account of it. In order to describe it as I found it, I must differ from them all. It is situated in one of the principal streets of Stamboul, (Constantinople,) near the Chatladi gate, and is said to have derived its modern name from having been burnt by fire. There is a story current, both among the Franks and Turks, that some Jews burnt it, and melted the gold plates with which it is said to have been covered; but the story, though universally believed, is not worthy of the slightest credit, as nothing like authority or date can be given for it. Hobhouse says it is called the Burnt Pillar from its burnt appearance, and certainly to a casual observer it does appear as if it had been burnt by fire; yet, on a close and careful examination, I could not find one vestige of fire ever having touched it; in fact it owes its black and burnt appearance to time and the elements. The first time I visited it, there were houses built on two sides of it; the other two were open, and dug round for the purpose of building: and on my second visit, a few months after, I found a new and elegant white stone guard-house, giving to its base the appearance in the engraving. In consequence of the ground being dug all around it, I had an opportunity of observing the nature of the foundation as well as the pedestal, which I found of the most solid structure.

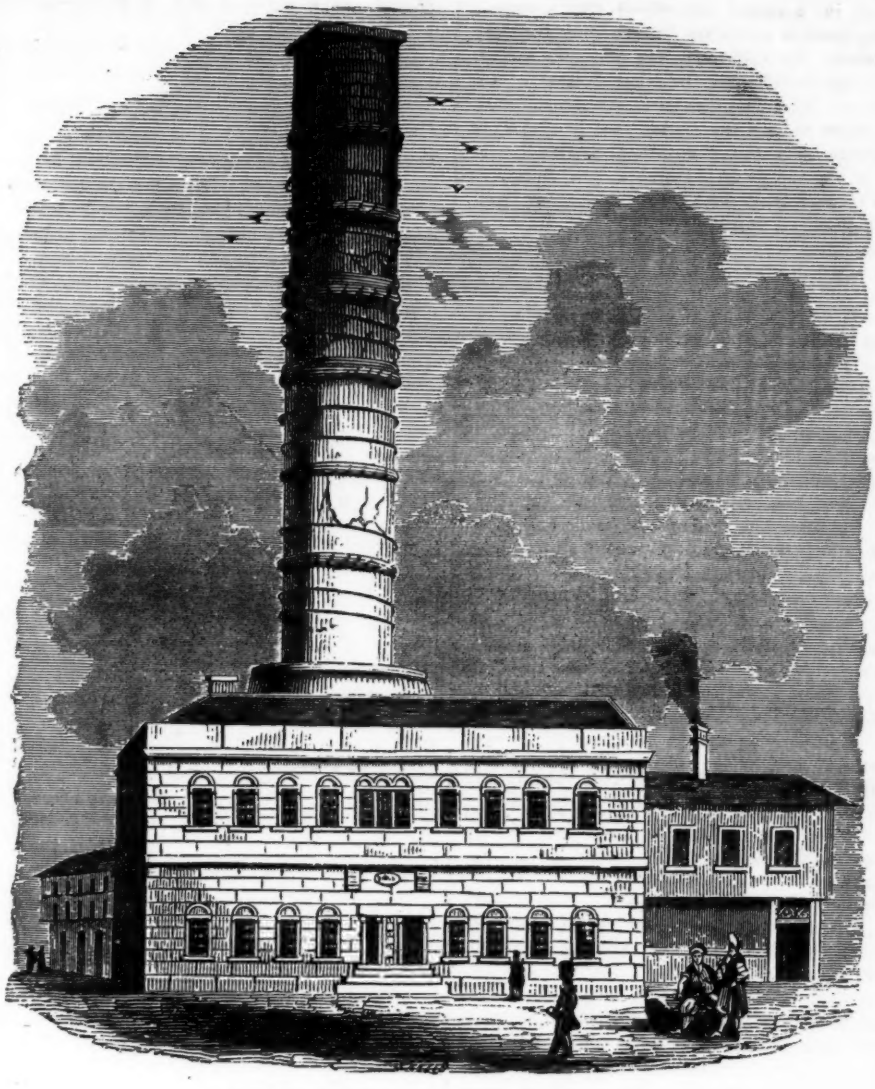
The pillar consists of six blocks of red granite or porphyry, each about ten feet high, and six in diameter. The capital consists of twelve rows of masonry, and the whole is crowned by a square row of stones about eighteen inches high.

Hobhouse calls it ninety feet high, but I think that an actual measurement with instruments would bring it very close upon one hundred and five, as I was very careful in comparing one point with another, and measuring it. It is encircled with fourteen iron hoops, of a much more modern date than the pillar itself, and these have evidently been put on to prevent the stone coming off in large scales, as it appears prone to do: in fact, at the time I saw it, there were various loose fragments which were only held to the body of the column by these hoops, and many places from which other pieces had fallen.

Hobhouse says that these hoops conceal the joints of the pillar, but in that he is mistaken, as the joints are marked by the wreath of laurel, about twelve inches deep, round the bottom of each block of stone. He is correct, however, in saying that the hoops are of iron, and it is difficult to imagine how Wheler made such a mistake as to call them brass.

Tournefort, who visited Constantinople in 1700, says that it is composed of "porphyry stones, the junctures hid by copper rings." If such were the case in his day the rings must have been taken away, as, with the exception of the iron hoops, there is no metal about it. Pococke says that it originally consisted of ten blocks, and that *seven* of these now remain; and he describes the masonry on the top so accurately, that there is no doubt it remains now as in his day; yet there are only *six* blocks. The inscription upon the top is in Greek, much dilapidated, and too high to be read from the street.

When there is so much discrepancy in the accounts of those who say they have seen this pillar, we can hardly expect a very correct historical account of it. The column is said to have been originally 120 feet high, and



THE BURNT PILLAR AT CONSTANTINOPLE.

to have supported a bronze statue of the Trojan Apollo, supposed to have been the work of Phidias, (B.C. 450); it was of colossal height, bore a sceptre in its right hand, a globe in its left, and a crown of glittering rays upon its head. Although originally modelled for Apollo, Constantine called it after his own name.

Glycas says that, towards the close of the reign of Nicephorus Botoniates, (A.D. 1080,) the pillar was struck by lightning, and the statue thrown down—and, according to the inscription upon it, which is given by Wheler, it appears to have been repaired by the Emperor Manuel Comnenus (A.D. 1180.)

Whatever the pillar once was, it is now an ugly unshapely mass; and however grand the object may have been for which it was raised, it is unregarded by its present possessors, who seemed to consider that the time I was engaged in examining it would have been much better employed in smoking a pipe at the neighbouring câfé, and I was asked more than once if I was going to take it away, as those around me could not understand the motive for what appeared to them so much useless labour. There was, however, one middle-aged Turk who asked me to smoke a pipe with him, and when we had got fairly seated, he patronisingly recommended me not to employ my time on such old ugly pillars as the one beside us, but said, if I wished something good to paint, that there were some very fine new ones, prettily gilded and painted, on the top of the new palace on the Bosphorus;—the tasteful Turk was describing to me, as works of high art, the chimney-tops of the Sultan's kitchen!

W.

THE MISSISIPPI SCHEME.

THE pages of the *Saturday Magazine* are, for obvious reasons, kept clear of those exciting topics which engage the attention of politicians; still, there have been events in the past history of nations which are now viewed pretty nearly in the same light by all thinking persons, and which are capable of affording instructive lessons. One such event was the mania—the national insanity, we may almost term it—which seized on the French people, at the early part of the last century, in favour of a speculation known as the MISSISIPPI SCHEME, the professed object of which was to insure large fortunes in a very little time; a plan which is nearly always attended with ruinous consequences.

The author of this delusive scheme was one John Law, who was born at Edinburgh, in the year 1671, of wealthy parents; and, after receiving a good education, during which he was known to pay much attention to matters connected with political economy, ran into profligacy and dissipation. He was sentenced to death for

having killed in a duel a gentleman whose domestic peace he had destroyed, but was respited, and afterwards made his escape from prison, and fled to Holland, where he became secretary to the British resident. He found means to return to his own country about the year 1700, without molestation, and began to promulgate a scheme for relieving Scotland from some financial difficulties, by the issue of paper money on landed security. This plan was rejected by the parliament, and Law returned to the Continent.

He then became a gambler, and such was his skill and address that, by the year 1714, he was master of 110,000*l.*, and had managed to gain the good opinion of the King of Sardinia, the Duke of Orléans, the Prince, of Conti, the Duke de Vendôme, and other foreigners of distinction. France at this time was in a desperate state: the expensive wars in which Louis the Fourteenth had been engaged, and the extravagant proceedings of the court, had so reduced the national finances, that it was proposed to sponge out the whole of the national debt. The disgraceful expedient was however rejected by the regent Orléans, and a committee was appointed to inquire what course could be adopted. This was just the state of affairs to suit Law, and he was not slow in taking advantage of it. He proposed to liquidate the national debt by issuing notes secured upon landed property and the royal revenues This plan being rejected, Law proceeded to establish a bank of his own, assisted by those who chose to join him; but after two years, the regent seeing that the new plan promised success, took it into his own hands, and formed a royal bank, of which he made Law the director-general.

The time was now ripe for the famous Missisippi scheme, a scheme as stupendous as it was extravagant. France possessed the extensive country of Louisiana, in North America, which is watered throughout its whole extent by the river Missisippi; but as commerce, navigation, and manufactures, were at a stand for want of funds, this colony was of very little use. Law proposed to remedy all these evils at once, by vesting the whole of the privileges, effects, and possessions of all the foreign trading companies, the great farms, the mint, the royal revenues, and the property of the bank, in one great company, who, having thus in their hands all the trade, taxes, and royal revenues, might multiply the notes of the bank to any extent they pleased, doubling or even tripling at will the circulating medium of the kingdom, and, by the immensity of their funds, carry the foreign trade and the improvement of the colonies to a height unattainable by other means. The principles of national wealth were but little understood at that time; and, however wild and chimerical such a scheme may now appear, it was received with avidity by persons of all classes in France, as a sovereign panacea for the distresses of the nation. Letters-patent were granted to the company, under the title of the "Company of the West," and they were authorized to raise a capital of 100,000,000 livres. The company first had a grant of the whole province of Louisiana; then the farming of the revenues on tobacco was made over to them, on the payment of a large sum into the national treasury. Afterwards they became in succession the proprietors of the Senegal Company, the East India Company, the China Company, the South Sea Company, and others, and the company changed its name to the "Company of the Indies." In July, 1718, the mint was made over to them, on the payment of 50,000,000 livres within fifteen months; and afterwards the whole receipt of the revenue was placed in their hands, for a further advance.

The company had thus actually obtained, in the course of a few months, all that Law had promised; for they concentrated in themselves nearly all the public and joint-stock wealth of France. The reader may naturally inquire what effect this extraordinary movement produced. The 100,000,000 livres, which constituted the original capital, was raised by 200,000 shares, of 500 livres each; and after some of the extraordinary grants had been made to the company, the expectation of enormous profits was so general, that people were desirous of becoming shareholders on any terms. The competition for shares speedily raised their price from five hundred to a thousand livres, so that those who had purchased the original shares were now enabled to get cent. per cent. profit on them. But when the royal revenues were placed in the hands of the company, the competition for shares amounted almost to frenzy, insomuch that the price speedily rose to 5000 livres per share. All classes, peers, princes, statesmen, magistrates, clergymen, mechanics, all scraped together what ready money they possessed, and the competition for shares was so great, that the price at last rose to 10,000 livres per share. The effect of this state of things may in some degree be imagined. If a purchaser of the original shares, at 500 livres each, sold them a few months afterwards for 10,000, he had a clear profit of 2000 per cent. But this was not all. When the company was about to be formed, shareholders were permitted to pay for their shares in a depreciated paper currency, called *billets d'état*, which were not then worth above one-third of their nominal value, but the subsequent price of 10,000 livres was payable in metallic currency; so that in less than twelve months, shares were sold at sixty times the sum they originally cost.

The consequences of this rapid transmission of money from hand to hand, were most startling, and ludicrous stories are related of the effects of the sudden fortunes made by humble individuals. Cook-maids and waiting-women appeared at the opera bedizened in jewels; and a baker's son purchased the whole contents of a jeweller's shop. As to Law himself, he became in many respects the first man in France; he was made comptroller general of the finances, he possessed the confidence of the regent, and was courted by princes, peers, and marshals, who waited at his levees as if he had been a sovereign. He amassed such immense property, that he was enabled to purchase no less than fourteen estates with titles annexed to them.

But such an unnatural state of things could not last long; no *new* wealth had been produced by this scheme, which was nothing but a change of money from one hand to another, by artificial means. The first circumstance which indicated the rottenness of the scheme was the continual demand on the bank for gold and silver specie: the original purchasers of the shares converted their newly acquired property into gold, and sent it out of the kingdom, as a security against the approaching storm; it was estimated that not less than 500,000,000 livres in specie were conveyed out of France. This alarmed the government, and it was ordered that small payments only should be made in specie, and soon afterwards that no person should keep more than 500 livres in their possession, the bulk of their money being in notes.

But the finishing stroke was brought on by the following circumstance. The bank, acting in concert with this all-engrossing company, had issued paper money with such rapidity, that by the month of May it amounted to 2,600,000,000 livres, while the whole of the metallic specie of the empire amounted to only about half that sum. It was proposed, therefore, either that the value of a paper livre should be diminished one-half, or that the value of a livre in specie should be doubled, in order to equalize the paper currency with the metallic. This proposal Law opposed, but it was carried against him; and the people were thunderstruck at hearing that the value of the notes was reduced one half. The effect of this breach of national faith was instantaneous; the notes became mere waste paper; those who had gold, feeling that the government which had reduced the value of the notes to one half, might proceed still further, refused to exchange their gold for notes on any

terms; and the holders of the notes (amounting to 90,000,000*l.* sterling English) were reduced to beggary.

John Law at once fell from the height of power and became an object of execration, and his life was in danger from the rage of the unfortunate note-holders. He escaped from France, and his immense possessions were confiscated to the crown as having been acquired through unfair means. He wandered from country to country, and experienced a truth which more worthy men have often bitterly felt,—that friends in time of prosperity become strangers with cold hands and hearts, when adversity overtakes those whom they formerly flattered. Law was persecuted nowhere out of France, but he was neglected everywhere, and died a poor man, in the year 1729, before he had passed the middle period of life.

Thus ended the Missisippi Scheme; and France had for many years to lament the short-sighted policy which had subjected her to such severe distress.

HISTORY OF THE SMALL-POX, AND OF THE MEANS FOR ITS PREVENTION.

I.

ORIGIN AND PROGRESS OF THE SMALL-POX. INTRODUCTION OF INOCULATION.

ALTHOUGH the details of subjects connected with the practice of medicine can seldom be laid with advantage before the general reader, yet all persons aspiring to a liberal education should make themselves acquainted with the historical and literary portions of these, furnishing, as they frequently do, matter of an interesting and instructive character. Of all subjects of this kind the *Small-pox* is that which should interest an Englishman most, as it is from the exertions of his countrymen that all the attempts at removing or alleviating this scourge of the human race have emanated. This is literally the case, whether we consider the improved modes of treating the disease, introduced by Sydenham and Cullen, the introduction of inoculation into Europe by Lady Montagu, or the discovery of vaccination by Dr. Jenner.

The origin of small-pox is involved in much obscurity, and has given rise to many discussions. While some believe it to be identical with the plague of boils and blains inflicted upon the Egyptians, and with many of the diseases described by the Greek and Roman authors, others consider these analogies to be fanciful. According to the reports of Du Halde and others, this disease has been known in China for 1200 years prior to the Christian era, under the name of *Tai-tov*, or "Venom from the mother's breast." In Hindostan, also, the Brahmins declare that the disease has been recognized from the remotest antiquity, and that the *Vedas* contains a form for the adoration of a tutelar deity of the small-pox. Wherever the disease may have originated, the first distinct account we possess of its existence is of its breaking out among the Arabians, at the commencement of the seventh century. This epoch (622) was most favourable for its dissemination, being that in which Mahomet led forth his followers, animated with fanatical zeal, to the conquest of various countries. In thirty years he and his successors had conquered Syria, Egypt, and Persia, and diffused the disease over all these countries. So freely did this diffusion of the malady take place over the Mohammedan empire, that the Saracen physicians founded their treatment on the theory that it arose from a natural change in the human constitution. It spread into Europe during the eighth century, after the conquest of Spain and Sicily; and in 731 the Saracens crossed the Pyrenees, and invaded France They were repulsed before the walls of Tours, by Charles Martel, yet they left the infection of the small-pox and measles behind them. Mead and others have attributed the introduction of small-pox into Europe to the returned crusaders; but, although these may have brought fresh irruptions of the disease, it was known two centuries prior to that epoch. The examination of some old Irish MSS., in the Bodleian Library, has led Dr. O'Connor to believe that the ravages of small-pox were known in Ireland as early as 679 and 742. However this may be, Great Britain could not escape for long a contagion which had overspread Europe; but the earliest accounts antiquarians can discover of its existence here refer to the commencement of the tenth century. In the Harleian and Cotton MSS., at the British Museum, are preserved prayers and exorcisms employed against the small-pox, showing the great terror that then prevailed upon the subject. Amulets, consecrated to St. Nicaise, (who had himself suffered from the disease, when Bishop of Rheims,) were worn as protectives by the nuns. Holinshed is the first English historian who expressly mentions the disease: speaking of the year 1366, he says, "Also manie died of the Small Pocks, both men, women, and children." The disease was transported to the continent of America by the followers of Columbus.

Considerable difficulty exists in judging of the extent of the ravages of small-pox in former times. The obscurity of early medical records, and their admixture with monkish fables and miracles, prevent our deriving much information from these sources. Again, as Dr. Moore has observed, the term "plague" or "pestilence" was formerly of much more vague and general application than in our own day, and almost every considerable epidemic was so designated: thus, in translating the Arabic writers upon this subject, the word plague was long used to express the term small-pox, and two very different diseases were confounded under the same title. There is little doubt that some of the pestilences of fire, so frequently raging in France, were attacks of small-pox, and there is reason to believe that the disease was frequent in its recurrence, and terrible in its mortality. In more modern times our accounts, of course, are more authentic. Dr. Jurin has calculated that one out of every fourteen born died of small-pox, and that one out of every five or six affected with the disease perished. Dr. Lettsom proved, from the Bills of Mortality, that the average number of deaths from 1667 to 1722 was to the whole number as 72 is to 1000, and from 1731 to 1772 as 89 to 1000.

But in its epidemic visitations this disease is more destructive of human life than the plague itself; and if, as Condamine states, it decimates in civilized life, it almost depopulates when carried among comparatively uncivilized races. Thus the capital of Thibet was after an epidemic deserted for three years, and Dr. Robertson and subsequent writers have described whole nations exterminated by this disease in America. In Russia two millions are said to have died of small-pox in one year, and one half of the persons attacked at Constantinople perished. Dr. Lettsom has calculated that not less than 210,000 fell annually victims to it in Europe, and Bernouilli estimates that not less than 15,000,000 of human beings thus perished in a quarter of a century. The disease seems to have been as fatal at the North Pole as under the Line, for in 1707 about 16,000 persons were carried off in Iceland, and in 1733 Greenland was nearly depopulated by it.

It may readily be supposed that so severe a disease as small-pox has called forth numerous proposals for its treatment. It is not our purpose to allude to these. We will only observe that most of the plans put into force originated with the Arabic physicians, or were the offspring of the dominant theory of the day, until the seventeenth century, when Sydenham, after describing the disease with an exactitude which has never been surpassed, and distinguishing it from the measles, with

which it had been confounded, laid down principles of treatment, which were founded in common sense and exact observation. We will pass on at once to the introduction of the practice of *inoculation*. The principle upon which this practice is founded is this,—that small-pox rarely occurs twice in the same individual, and if the disease be communicated purposely to persons, by inserting some of the matter of the disease into their skin, they become subjected to a much milder disease, which is nearly equally as efficacious in protecting them from a second attack as when it occurs spontaneously in its severer form. It would seem that for some centuries the custom of what is called "sowing the small-pox" has been known in China, and the Brahmins are said long to have been in the habit of following this practice, accompanying the operation with solemn prayers, addressed to the deity of the small-pox. The Circassians and Georgians, again, call it "buying the small-pox," and are accustomed to make a small nominal present of fruit to the person from whom the matter is received. It is, however, from Constantinople that we directly received our information. Notices of the practice of "engrafting the small-pox," as it was then called, as performed in that city, were published in London and Venice, in 1703, by persons who had witnessed its success; but it obtained little or no notice until 1717, when the celebrated Lady Mary Wortley Montagu, who had accompanied her husband, then ambassador to the Ottoman Court, attracted general attention to it in one of her letters. In this she informed the public that a number of old women were in the habit of conducting the operation at Constantinople, with little inconvenience and the happiest results. Her own children were inoculated, as also were, shortly after, those of the Princess of Wales. The practice, now become fashionable, extended among persons of high rank. It was, however, soon discovered that the reports from Constantinople had been exaggerated, and it was found that the inoculated small-pox was occasionally a severe, and sometimes a fatal, disease. Some deaths occurring after inoculation, though in a very much less proportion than after the natural disease, a most determined opposition was organized against the practice. Many medical men opposed it, as an unjustifiable experiment, and several divines as an immoral proceeding, in attempting thus to arrest the decrees of Providence, and consenting to the self-infliction of a disease, which in its course might carry the individual prematurely before his Maker. The most eminent of the faculty of physic, however, approved of the practice, and several celebrated divines, among whom were Bishop Maddox and Dr. Doddridge, having convinced themselves of the efficiency of inoculation, proclaimed it as a Christian duty to endeavour by its means to diminish the fatality of small-pox. So slow at first, however, was the progress of inoculation, that only 897 persons were inoculated in eight years; and after a somewhat further trial, the practice seemed to be about to be relinquished, when news arrived of the wonderful success which had followed its adoption among the Indians of South America and the inhabitants of South Carolina.

These successes determined public opinion much in favour of inoculation, and, in 1746, the small-pox hospital was established for conferring the benefit upon the poorer classes, which had hitherto been confined to the wealthy. The operations in S. Carolina were performed by the planters themselves, and it has been remarked that these were frequently more successful when conducted by non-professional persons. This is supposed to have arisen from the custom which then prevailed among the profession of encumbering the practice with a number of needless precautions and restrictions, and the administering an unnecessary quantity of drugs. This opinion would seem to be confirmed by the success which attended the practice of the Suttons, two empirics, who, by simplifying the treatment adopted, met with few fatal cases, and were the means of rendering inoculation extremely popular in this country.

On the Continent, the practice of inoculation met with great opposition. In France, after a vigorous resistance on the part of the clergy and of the faculty of medicine, it was partially introduced in 1755, and the families of the Duke of Orleans and several of the nobility were inoculated. An extraordinarily fatal epidemic of small-pox, however, appearing in Paris in 1763, the government, believing the number of inoculations had caused the spreading of the disease, prohibited the practice. In Hanover, Sweden, and Denmark, the populace long resisted its introduction, and it made slow progress in Prussia and Germany. Catherine of Russia, desiring to set her subjects an example, had her own child inoculated, and the practice soon spread in that country; but, owing to a due want of caution in separating the inoculated from the rest of the community, the small-pox was thereby increased, and Sir A. Crichton states, that prior to the introduction of vaccination, one child in seven died from this terrible disease.

The flattering hopes entertained at the introduction of inoculation were not destined then to be realized. It is quite true that the inoculated disease was found to be infinitely less fatal than the natural, for while in this latter, one in six died, in the former, one in fifty, and after the improvements introduced by the Suttons, only one in two hundred died. It is also quite true that the natural small-pox very seldom attacks those who have been inoculated. But the fact which was lost sight of is, that the inoculated small-pox is just as contagious as the natural, and can impart to another as virulent a disease; so that, by thus diffusing inoculation, the number of centres or *foci* of infection were increased, and the disease spread over a wider surface; and, although individuals received security from inoculation, the community at large suffered. Thus, at the commencement of the eighteenth century, one-fourteenth of the mortality arose from the small-pox, while during the last thirty years of that century, when inoculation was in full vogue, that proportion arose to one-tenth. In the epidemic of 1796, 3549 persons lost their lives in London; and just before the introduction of vaccination, the total number of deaths in England from this disease was estimated at 45,000 annually. In Sweden and Spain, into which kingdom inoculation was scarcely admitted, the deaths from small-pox were fewer than in those countries into which it had been more freely introduced. This result could never have been prevented but by the adoption of two systems, both of which were impracticable, viz., universal inoculation, or where this was partial, the entire seclusion of those subjected to the operation.

THOUGH Justice has been called an "hobbling old dame, who cannot keep pace with Generosity," yet it is the hobbling old dame who creates confidence, and confidence is the firmest root of love, respect, and gratitude. Generosity may come with holiday gifts, but justice fills our cup with every-day comfort. We cannot live upon gifts; if we do we are degraded. Justice offers nothing but what may be accepted with honour; and lays claim to nothing in return, but what we ought not even to wish to withold.—*Woman's Rights and Duties.*

THE rubbing of the eyes doth not fetch out the mote, but makes them more red and angry; no more doth the distraction and fretting of the mind discharge it of any ill-humours, but rather makes them more abound to vex us. —BISHOP PATRICK.

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